THE USE OF SELECTED FACTORS FOR PREDICTION

OF SUCCESS IN ALGEBRA

by

GARY JOHN LAZARUS

B. S., Kansas State University, 1961

———————————

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1968

Approved by:

Floyd L. Coppedge

Major Professor

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Throughout the educational system it has become increasingly important to provide individual learning situations for all students. In an attempt to provide for individual differences, varied levels of classes have been introduced into the curriculum. As a result of the stratification in the course offerings it has placed more emphasis on matching the ability of the student to the level of the course material. Most of the placement has been done on the basis of test data and faculty opinions. In the interest of perfection, it is necessary to check our existing methods and search for better means of accomplishing this selection.

Errors in judgment of student aptitude in a given field can be reduced, but never eliminated. Hence no method of selection should ever be considered final.

In previous years Jardine Junior High School, Topeka, Kansas, has used the Iowa Algebra Aptitude Test, the teacher's evaluation, eighth grade mathematics marks, and a counselor's recommendation for placement of a student in ninth grade mathematics courses. Since the advent of modern mathematics in Topeka, 1963, the Iowa Algebra Aptitude Test has been dropped, because it was felt to be a test of achievement of previous material and did not maintain a predictive value sufficient to warrant the time taken in the administration of the test. Since that date the teacher's evaluation of mathematical ability and the eighth grade mathematics mark have guided each of our students in their selection of course work.

The selected parts of the Differential Aptitude Test as a predictive indicator were included in this study although they are not given until the beginning of the ninth grade year. The Differential Aptitude Test was included in this study to determine whether it was of sufficient value as an indicator to merit its administration during the latter part of the eighth grade year.

I. STATEMENT OF THE PROBLEM

The problem of this study was to determine the relationship of selected factors to success in algebra. The factors used were: (1) teacher's recommendation, (2) eighth grade mathematics mark, and (3) selected Differential Aptitude Test scores; Numerical Ability, Verbal Reasoning, and Numerical Ability plus Verbal Reasoning.

II. POPULATION

During the 1965-1966 school year a total of 211 students were enrolled in the ninth grade class at Jardine Junior High School. Of that total, seventeen students were either enrolled at the beginning of the school year or entered during the year. Since none of these students attended Jardine during the previous year, eighth grade mathematics marks were not available for this group. In addition, students enrolled during the year had no Differential Aptitude Test scores recorded at Jardine. Therefore the entire group of seventeen were excluded from use in this study.

Ten students moved out of the school district during the school year. As a result, they were not included in the study because their final yearly algebra marks were not available. There were forty-six pupils enrolled in the Special Mathematics classes at Jardine, which are designed for students with

an above average interest and ability in mathematics, and an equal number of forty-six enrolled in the General Mathematics course, which is a review of the basic operations of arithmetic.

Of the original total of two hundred and eleven students enrolled, ninety-two were enrolled in algebra for the complete year. This group comprised the population used in this study.

III. PROCEDURE

All of the eighth grade mathematics marks and algebra marks were obtained from permanent grade sheets kept by the school. The Differential Aptitude Test scores were available from records supplied by the testing company and kept in the counseling office. The teacher's recommendations were obtained through the counselor's office and/or the eighth grade teachers.

A comparison of teacher's recommendations and success in algebra was shown by tables. In some instances percentages were used to clarify or illustrate a situation or relationship. Tables and the Pearson Product-Moment coefficient of correlation[1] were used for the comparison of marks in eighth grade mathematics and algebra. In comparing the DAT scores and the marks in algebra the correlation coefficient was used.

IV. DEFINITIONS OF TERMS USED

Algebra. "Ninth grade algebra is an introductory course consisting of the study of real numbers and their properties, equations, inequalities,

---

[1] George W. Snedecor, _Statistical Methods_ (5th Edition; Ames, Iowa: The Iowa State College Press 1959), p. 162.

graphic representations and their application in the solution of both practi-
cal and thought problems."[2]

General Mathematics. "This is a refresher course in the fundamentals
of arithmetic. Topics in simple algebra, geometry, and inequalities are also
included. The course is designed for students who do not take ninth grade
algebra."[3]

Success in Algebra. Algebraic success was defined as a mark of A, B,
or C for comparison with the teacher's recommendations. These marks were se-
lected in consideration of the requirements for continuing in advanced mathe-
matics or related fields of study in the Topeka Public School System.

V. PURPOSE OF THE STUDY

The results of this paper, combined with similar studies and available
information, should be of value to people in the position of selecting stu-
dents for the various courses in ninth grade mathematics at Jardine Junior
High School.

VI. LIMITATIONS OF THE STUDY

The scores used in this study were obtained from one school and may
reflect certain characteristics of that school not controlled in this study.
The study is further limited to include only those students for whom scores
were available for all the selected factors. Thus the mobil or transient
student for the most part was not included.

---

[2] The Jardine Junior High School Faculty Handbook, Topeka, Kansas, p. 402
[3] Ibid.

REVIEW OF THE LITERATURE

The ability to predict a given outcome has preoccupied man since the beginning of time. There have been many predictive indicators developed for use in all fields. In mathematics, prognostic tests have been used for a half century.

The first attempt to predict mathematical ability, according to Joseph Orleans, was by Agnes Rogers in 1916, when she experimented with two groups of girls in New York City.[4] Rogers administered a battery of tests covering mathematics, languages, reading, and logic. From the results six parts were selected, which became the Rogers Test of Mathematical Ability. In a comparison of marks in algebra with the Rogers Test of Mathematical Ability a correlation of .82 was recorded.[5] After this early beginning many others followed the lead. The majority of early prognosticators used measures of intelligence as a guide to forecast mathematical ability.[6] All report a correlation (between intelligence quotient scores and algebra marks) within a range from .38 to .54.[7]

---

[4]Joseph Orleans, "A Study of Prognosis of Probable Success in Algebra and in Geometry," The Mathematics Teacher, Vol. 27, May, p. 172.

[5]Agnes Rogers, "Tests of Mathematical Ability," The Mathematics Teacher, Vol. 16, April, 1823, p. 196.

[6]Buckingham, B. R., "Mathematical Ability as Related to Intelligence," School Science & Mathematics, xxi, 205-215; Proctor, W. A., "Psychological Tests and Guidance of High School Pupils," Journal of Educational Research, Monograph 1921; Thorndike, E. L., "Abilities Involved in Algebraic Computation and in Problem Solving," School & Society, xv, 191-193; Brooks, Fowler D., The Psychology of Adolescence, Houghton-Mifflin Co. 1929; and Todd, Gertrude G., Bulletin Department of Secondary School Principals. 24:74-76, 1-29.

Orleans, op. cit., pp 178-179.

The interest in mathematical aptitude brought about the development of several tests designed to measure this aptitude; the Orleans Prognosis Test series, The Rogers Test of Mathematical Ability, and others. The most widely used and reported of these was the Orleans Prognosis of Algebra. Ferdinand Kertes in a New Jersey high school found a correlation of .72 for achievement and a combination of Orleans Prognosis test and arithmetic marks.[8]

However, not all the results were this high. When comparing the Orleans test for predicting achievement in geometry with teachers' marks in algebra and the Terman Group test of Mental Ability, Cooke and Pearson found no appreciable difference in the prognostication value of these three factors. The combination of all three gave a better prediction of achievement in geometry, but the addition of the second and third factors affected the accuracy of the prediction so slightly that they did not merit the additional time and effort to administer.[9]

A correlation of .61 was reported by C. C. Grover when the Orleans Algebra Prognosis Test was compared to an achievement test, the Columbia Research Bureau Algebra Test. A lower correlation, $(r + .48)$, was recorded in the comparison of intelligence quotients and the achievement test.[10]

In a study which covered the years 1930-1933, Ayers concluded that the best single predictor of algebra achievement was the teacher's estimate of

---

[8] Ibid., p. 240.

[9] Dennis Cooke and John M. Pearson, "Predicting Achievement in Plane Geometry," School Science and Mathematics, 24; Nov. 1933, p. 878.

[10] C. C. Grover, "Results of an Experiment in Predicting Success in First Year Algebra in Two Oakland Junior High Schools," Journal of Educational Psychology, XXIII, April 1932, p. 311.

algebraic ability, (r = .634).[11] However, a combination of the South Pasadena Prognostic Test, the teacher's estimate and the 8A Reasoning Test produced a correlation of r = .704.

In 1934, Lee and Hughes conducted a study, utilizing three hundred, thirty-eight students. The study measured success in algebra by an achievement test, the Columbia Research Bureau Algebra Test and teacher's marks; each yielding different results. These were compared with an aptitude test, the Lee Test of Algebraic Ability, IQ, teacher's rating of mathematical ability, and chronological age. They reported that the highest correlation with the achievement test was the aptitude test, r = .62. And the best predictor of grades was the trait rating, r = .60, with the teacher's estimate a close second, r = .59. Lee and Hughes concluded, "the teacher's preconceived ideas of the pupils' abilities were more influential in determining the pupils' final marks than were the pupils' achievements in the subjects as measured by a standardized achievement test."[12] This also could be interpreted to mean that the teacher's marks cover other factors besides achievement.

In other studies, Dickter found that the prognostic test, Roger's Test of Mathematical Ability, was the best predictor of algebra success, r = .65.[13] W. S. Guiler, in a later study, supported his conclusions although he used the Iowa Algebra Aptitude test to predict success in algebra.[14] He found a

[11] G. H. Ayers, "Predicting Success in Algebra," School and Society, Jan. 6, 1934, p. 18.

[12] J. Murray Lee and W. Hardin Hughes, "Predicting Success in Algebra and Geometry," School Review, March 1934, p. 191.

[13] Richard Dickter, "Predicting Algebraic Ability," School Review, Oct. 1933, p. 605.

[14] Walter S. Guiler, "Forcasting Achievement in Elementary Algebra," Journal of Educational Research, Vol. 38, 1944, p. 32.

correlation of r = .775 when the aptitude test was used with an achievement test, the Breslich Algebra Survey Test, Form B.

The use of an algebra prognosis or an arithmetic test was reported as the best indication of success in algebra by May Seagoe.[15] Another study by R. B. Layton reported the best predictor of algebra marks was the eighth grade arithmetic marks, r = .82.[16] The prognostic test and arithmetic marks together did not significantly improve the correlation coefficient above the single criteria in either of the reports.

These conclusions were validated in a summarization of reports and previous studies by Harl Douglas in 1935. He listed the following predictors in order of merit with the condition that there was "little choice between the variables a and b; variables c and d; and variables e, f, and g." Douglas defined the predictors as follows: (a) good prognosis test, (b) average mark in previous year, (c) IQ, (d) previous teacher's estimate of mathematical ability, (e) mental age, (f) achievement test or mark in previous years' work in mathematics, (g) chronological age, and (h) character trait rating.[17] His conclusions also stated that combinations of these factors generally would yield a higher correlation, although the difference is not always statistically significant.

---

[15]May V. Seagoe, "Prediction of Achievement in Elementary Algebra," Journal of Applied Psychology, Vol. 22, 1938, p. 503.

[16]R. B. Layton, "A Study of Prognosis in High School Algebra," Journal of Educational Research, April 1941, p. 603.

[17]Harl R. Douglas, "The Prediction of Pupil Success in High School Mathematics," Mathematics Teacher, Vol. 28, Dec. 1935.

The development of other tests led to more experimentation. In a study conducted in 1952-1953, Cincinnati Public Schools used the Terman McNemar test of Mental Ability, an English proficiency and an arithmetic proficiency test with the Differential Aptitude Test. The best predictor of mathematics grade point averages was the arithmetic proficiency test, r = .61 for boys and r = .67 for girls. The DAT scores did not show a high correlation with academic success in the sample studied and were not justified for purposes of prediction.[18]

This latter conclusion was not confirmed in other studies, for example, the study conducted by H. G. Osburn and R. S. Melton, in 1963.[19] Osburn and Melton administered four aptitude batteries; the Iowa Algebra Aptitude Test, Orleans Algebra Prognosis Test, the S.R.A. Primary Mental Abilities, and the Differential Aptitude Test. These were given to an experimental group of students in modern mathematics and a group in the traditional algebra. The sum of the Verbal Reasoning and Numerical Ability scales from the DAT predicted proficiency in both courses with validity equal to that of the Iowa Algebra Aptitude Test and the Orleans Algebra Prognosis Test. The correlation values for all predictors and the final tests in algebra were between .63 and .72. This study also noted a higher correlation for the Spatial and Mechanical Reasoning tests of the DAT with the stu-

---

[18] James Jacobs, "Aptitude and Achievement Measures in Predicting High School Academic Success," The Personnel and Guidance Journal, Vol. 37, Jan. 1959, p. 341.

[19] H. G. Osburn and R. S. Melton, "Prediction of Proficiency in Modern and Traditional Course in Beginning Algebra," Educational and Psychological Measurement, Vol. 23, Summer, 1963, p. 287.

dents in the experimental course. The students in the traditional course had higher values in the Spelling test section.

1. In a study of achievement in algebra as related to the Verbal Reasoning and Numerical Ability section of the Differential Aptitude Test, Ralph Cain reported a higher correlation for Numerical Ability and traditional algebra, r = .46.

2. An even higher correlation for the Biological Sciences Curriculum Study Group and Numerical Ability of r = .68 was recorded.[20]

The later reports make use of several predictors and generally conclude that the best single indicator is the previous year's mathematics grades,[21] or an aptitude test.[22] "Indeed there is some general agreement concerning the variables to be used in such prediction schemes, but the weights required for their optimal combination depend upon the local situation."[23]

[20] Ralph Cain, "Relationships of Verbal Reasoning and Numerical Ability to Achievement in First Year Algebra," School Science and Mathematics, Feb. 1966, p. 123.

[21] James C. Shortt, "Predicting Success in Geometry, Algebra II and Senior Mathematics at Larned High School," Master's Report, Kansas State U., 1964.

[22] John M. Ivanoff and DeWame Evermode, "Use of Discriminant Analysis for Selecting Students for Ninth Grade Algebra or General Mathematics," Mathematics Teacher, May 1965.

[23] Ibid., p. 412.

RESULTS OF THE STUDY

The study includes the ninety-two students enrolled in Algebra at Jardine Junior High School, Topeka, Kansas. In comparing the teacher's recommendation with the course selected, eighty-nine per cent of the students followed the teacher's recommendation. There were fifteen students recommended for General Mathematics who decided to continue in Algebra. The table below lists the number in each category for those students taking Algebra.

TABLE I

A COMPARISON OF TEACHER RECOMMENDATIONS
AND ALGEBRA MARKS

	A	B	C	D	F
Algebra	15	26	18	17	1
General Mathematics . . .	–	–	4	9	2

Using the stated definition for success in Algebra, seventy-seven per cent of the students following their teacher's recommendation for Algebra received a grade of C or better. It is also noted that of those recommended for General Mathematics who chose to take Algebra, only twenty-seven per cent received a grade of C or better.

Table II shows what might be expected from the student entering algebra on the basis of his previous work in eighth grade mathematics. This table which includes all of the students in algebra classes shows that fifty-one per cent of the students will maintain or improve over the mark they received in eighth grade mathematics. If the fifteen students recommended for general mathematics are excluded and only those students recommended by their eighth grade teacher for algebra are used, fifty-three per cent will maintain or improve their previous year's marks. From Table II it is apparant that the eighth grade mark does predict within one letter grade the mark received in algebra for ninety-one per cent of the students. Thus for every ten students receiving a C in the eighth grade, nine will receive a B, C, or D in algebra. Considering only the students in eighth grade mathematics with a mark of A, B, or C, seventy-two per cent will achieve success in algebra.

TABLE II

A COMPARISON OF EIGHTH GRADE MATHEMATICS
MARKS WITH ALGEBRA MARKS

		A	B	C	D	F
Eighth Grade Marks	A	10	6	0	0	0
	B	5	19	13	7	0
	C	0	1	9	16	1
	D	0	0	0	3	2

For numerical analysis each of the grades was translated into numbers using the following relationship: A = 4, B = 3, C = 2, D = 1, and F = 0. The use of the sample correlation coefficient, r, yields the following results. The value of r for eighth grade marks and algebra marks is .747, (see Table III). Use of the table for correlation coefficients at the .01 level of significance with ninety degrees of freedom gives a value of .267[24] above which there is a significant relationship. The value of .747 for r leads to the conclusion that there is a significant correlation present.

TABLE III

SUMMARY OF THE STATISTICAL RELATIONSHIPS OF
ALGEBRA MARKS AND INDICATORS FOR ALGEBRA

	r
Eighth Grade Marks . . .	r = .747 *
Numerical Ability . . .	r = .567 *
Verbal Reasoning	r = .108
N.A + V.R.	r = .389 *

* Indicates significance at the .01 level.

The comparison of the three selected parts of the Differential Aptitude Test with the algebra marks resulted in a variety of relationships. The Numerical Ability section of the test resulted a value of r = .567 when compared with algebra marks, (see Table III). This proved to be significant at the .01 level.

---

[24] George W. Snedecor, op. cit., p. 174.

For the Verbal Reasoning section of the Differential Aptitude Test the value of r was computed to be .108, not large enough to be of significant value, (see Table III, page 13). This section of the DAT did not show any significant relationship with corresponding grades in algebra.

In the section on Verbal Reasoning plus Numerical Ability of the DAT, the writer found a value of the statistic r equal to .389. This was large enough at the one per cent level of significance to state a significant positive correlation.

I. SUMMARY

Of the students following the teacher's recommendation for algebra, seventy-seven per cent received a grade of at least C. Only twenty-seven per cent of the students not recommended for, but selecting algebra, received a grade of C or better.

In comparing the eighth grade marks with the algebra marks, it was noted that fifty-one per cent of the students will maintain or improve their corresponding grade in algebra. Using this same table, the conclusion that the students who achieve success in the eighth grade course will also achieve success in the algebra class is true for seventy-two per cent of the sample.

The eighth grade marks and the scores from the Differential Aptitude Test of Numerical Ability and Numerical Ability plus Verbal Reasoning have a significant positive correlation with the algebra marks. The Verbal Reasoning section shows a low correlation which is not significant at the .01 level.

II. CONCLUSIONS

The present system of selecting students for algebra classes in Jardine Junior High School yields higher numerical correlations than the other factors used in this study. The students following the teacher's recommendation have a high percentage (77%) of academic success in algebra. The correlation with algebra marks for the selected parts of the Differential Aptitude Test, is not as high as the correlation coefficients for the factors presently being used. For Jardine Junior High the present procedure using eighth grade mathematics marks and teacher's recommendations seems to be valid.

III. RECOMMENDATIONS

From these findings it should be apparent that the students receiving an A or B in eighth grade mathematics should be enrolled in algebra. For those students with a C in eighth grade math more consideration should be given to the teacher's evaluation.

BIBLIOGRAPHY

BIBLIOGRAPHY

Ayers, G. H. "Predicting Success in Algebra," School and Society, 39: 17-18,
    January 6, 1934, No. 993.

Barnes, W. E. and Asher, J. W. "Predicting Students and Success in First
    Year Algebra," Mathematics Teacher, 55: 651-4, D. 62.

Bennett, George K., Harold G. Seashore, and Alexander G. Wesman. Differential
    Aptitude Tests Manual. 3rd Edition, New York, The Psychological Corpora-
    tion, 1959.

Boyce, R. W. "Prediction of Achievement in College Algebra," Ed. and Psychol.
    Measure, 24: 419-20, Sum. 64.

Buros, Oscar Krisen (ed.) The Fifth Mental Measurements Yearbook, Highland
    Park, New Jersey, the Gryphon Press, 1959.

Cain, Ralph W. "Relationship of Verbal Reasoning and Numerical Ability to
    Achievement in First Year Algebra," School Science and Mathematics, 66:
    131-4, F '66.

Call, R. J. and N. A. Wiggin. "Reading and Mathematics," Mathematical Teacher,
    59: 149-57, F. '66

Callicutt, W. "Problem of Predicting Success in Algebra," National Associa-
    tion Secondary School Principals Bulletin, 45: 107-11, N '61.

Clifton, L. L. "Prediction of High School Marks in Elementary Algebra,"
    Journal of Experimental Education, VIII, pp. 410-13, June, 1940.

Cooke, Dennis H. and John M. Pearson. "Predicting Achievement in Plane Geom-
    etry," School Science and Mathematics, 24: 872-878, Nov., 1933.

Dickter, Richard. "Predicting Algebraic Ability," School Review, 41: 604-606,
    Oct., 1933.

Grover, C. C. "Results of an Experiment in Predicting Success in First Year
    Algebra in Two Oakland Junior High Schools," Journal of Educational Psy-
    chology, XXIII (April, 1932), pp. 309-14.

Guiler, Walter S. "Forecasting Achievement in Elementary Algebra," Journal
    Educational Research, 38: 25-33; 1944.

Guilford, J. P. Fundamental Statistics in Psychology and Education, 4th Ed.,
    New York: McGraw-Hill Book Co., 1965.

Ivanoff, J. M., et. al. "Use of Discriminant Analysis for Selecting Students
    for Ninth Grade Algebra or General Mathematics," Mathematics Teacher,
    58: 412-16, May, 1965.

Jacobs, James. "Aptitude and Achievement Measures in Predicting High School Academic Success," The Personnel and Guidance Journal, 37: 334-341, January, 1959.

Kellar, Wylma Rose. "The Relative Contribution of Certain Factors in Individual Differences in Algebraic Problem Solving Ability," Journal of Experimental Education, VIII (September, 1934), pp. 26-35.

Layton, R. B. "A Study of Prognosis in High School Algebra," Journal of Educational Research, 34: 601-605, April, 1941.

Lee, J. Murray, and W. Hardin Hughes. "Predicting Success in Algebra and Geometry," School Review, 42: 188-196, March, 1934.

Orleans, Joseph B. "A Study of Prognosis of Probable Success in Algebra and in Geometry," The Mathematics Teacher, 27: 225-246, May, 1934.

Osburn, H. G., et. al. "Prediction of Proficiency in a Modern and Traditional Course in Beginning Algebra," Ed. and Psychol. M., 23: 277-87, Summer, 1963.

Rezac, James L. "Predicting Success of Ninth Grade Mathematics Students in Manhattan Junior High School, Masters' Report, Kansas State University, Manhattan, Kansas, 1962.

Experimental Tests of Mathematical Ability and Their Prognostic Value, Teachers College Contribution to Education, New York Teachers College, Columbia, University, 1918, No. 190.

Read, C. B. "History of Math," School Science and Mathematics, 66: 156-7, February, 1966.

Rogers, Agnes. "Tests of Mathematical Ability," The Mathematics Teacher.

Seagoe, May V. "Prediction of Achievement in Elementary Algebra," Journal of Applied Psychology, 22: 493-503, 1938.

Shortt, James C. Jr. "Predicting Success in Geometry and Senior Mathematics at Larned High School," Masters' Report, K.S.U., 1964.

Sommerfeld, R. E. "Study of Selected Predictors of Success in Second Year Algebra in High School," High School Journal, 46: 234-40, April, 1963.

APPENDIX

APPENDIX A

TABLE IV

ORIGINAL DATA

Student Number	DAT PERCENTILES			MATH GRADES		Teacher's Recommendation
	V.R.	N.A.	V+N	8th	Alg.	
1	50	35	45	B	C	Alg.
2	95	70	90	A	A	Alg.
3	75	55	70	B	C	Alg.
4	60	65	60	B	A	Alg.
5	65	55	60	B	C	Alg.
6	75	70	75	C	D	Alg.
7	45	40	40	C	D	Alg.
8	60	90	75	A	A	Alg.
9	45	40	45	B	C	Alg.
10	90	65	85	A	A	Alg.
11	70	55	65	A	B	Alg.
12	75	60	70	B	D	Alg.
13	65	75	70	B	B	Alg.
14	40	45	40	C	D	Alg.
15	65	50	60	B	C	Alg.
16	35	70	50	A	A	Alg.
17	85	90	90	B	A	Alg.
18	70	80	75	A	B	Alg.
19	70	75	75	B	C	Alg.
20	80	65	75	B	C	Alg.
21	60	50	55	B	B	Alg.
22	80	20	55	C	D	Alg.
23	70	80	80	B	D	Alg.
24	65	45	55	C	D	Gen. Math
25	35	35	35	C	D	Gen. Math
26	85	60	75	A	A	Alg.
27	30	30	25	C	F	Alg.
28	70	60	70	B	B	Alg.
29	40	40	40	B	B	Alg.
30	65	75	70	C	C	Alg.

TABLE IV (continued)

Student Number	DAT PERCENTILES			MATH GRADES		Teacher's Recommendation
	V.R.	N.A.	V+N	8th	Alg.	
31	80	60	75	B	C	Alg.
32	55	75	65	A	A	Alg.
33	30	97	70	A	A	Alg.
34	65	40	55	B	D	Alg.
35	75	15	50	D	F	Gen. Math
36	70	35	55	D	F	Gen. Math
37	40	80	60	B	B	Alg.
38	90	80	90	B	B	Alg.
39	15	60	35	B	C	Alg.
40	60	80	75	B	D	Alg.
41	15	55	35	C	C	Gen. Math
42	55	50	50	B	B	Alg.
43	15	60	35	B	A	Alg.
44	65	55	60	C	D	Alg.
45	65	75	70	B	B	Alg.
46	65	60	60	B	A	Alg.
47	55	85	70	A	B	Alg.
48	90	30	70	B	B	Alg.
49	30	30	30	C	D	Gen. Math
50	30	30	25	C	D	Alg.
51	40	50	45	C	C	Alg.
52	85	50	75	A	A	Alg.
53	60	30	50	B	D	Alg.
54	65	40	55	B	D	Alg.
55	65	35	55	C	D	Gen. Math
56	50	50	50	B	B	Alg.
57	35	55	40	C	C	Gen. Math
58	80	85	85	B	B	Alg.
59	65	70	65	B	A	Alg.
60	85	25	65	B	C	Alg.
61	60	65	60	B	C	Alg.
62	20	60	35	C	C	Alg.
63	75	60	70	C	B	Alg.
64	70	90	85	A	B	Alg.
65	75	75	75	B	B	Alg.
66	60	65	60	A	B	Alg.

TABLE IV (continued)

Student Number	DAT PERCENTILES			MATH GRADES		Teacher's Recommendation
	V.R.	N.A.	V+N	8th	Alg.	
67	60	70	60	B	C	Alg.
68	70	80	75	B	B	Alg.
69	80	97	95	C	C	Gen. Math
70	90	99	97	A	A	Alg.
71	25	45	30	C	C	Gen. Math
72	75	65	75	C	C	Alg.
73	60	75	70	B	B	Alg.
74	45	75	55	B	B	Alg.
75	55	70	60	B	B	Alg.
76	40	50	45	B	D	Alg.
77	70	50	60	D	D	Gen. Math
78	85	70	80	C	D	Alg.
79	80	90	90	A	A	Alg.
80	80	45	70	D	D	Alg.
81	40	70	55	C	D	Gen. Math
82	55	35	45	C	D	Gen. Math
83	10	50	25	B	B	Alg.
84	55	50	55	C	D	Alg.
85	70	75	75	A	B	Alg.
86	60	55	55	C	D	Alg.
87	85	50	75	C	C	Alg.
88	85	40	70	C	D	Gen. Math
89	80	15	55	D	D	Gen. Math
90	75	25	55	B	B	Alg.
91	65	65	65	B	B	Alg.
92	80	55	75	B	C	Alg.

ABSTRACT

THE USE OF SELECTED FACTORS FOR PREDICTION

OF SUCCESS IN ALGEBRA

by

GARY JOHN LAZARUS

B. S., Kansas State University, 1961

AN ABSTRACT OF A REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1968

The problem of this study was to determine the relationship of selected factors to success in algebra. The factors were: (1) teacher's recommendation, (2) eighth grade mathematics marks, and (3) selected Differential Aptitude Test (DAT)scores: Numerical Ability (NA), Verbal Reasoning (VR), and Numerical Ability plus Verbal Reasoning (NA + VR). These were compared with marks received in algebra which provided the measure of success.

The data was collected from information contained in the school records at Jardine Junior High School and other teachers. The correlations were computed using the r statistic, Pearsons Product-Moment of Correlation and tested for significance.

Of the students following the teacher's recommendation for algebra, seventy-seven per cent were able to receive at least a C in algebra. The mark from the eighth grade mathematics course predicted within one letter grade the mark received in algebra for ninety-one per cent of the students. From the group of students receiving an A, B, or C in eighth grade mathematics, seventy-two per cent were able to achieve at least a C in algebra.

The best predictor of algebra marks was the eighth grade mathematics marks, $(r = .747)$. The selected parts of the DAT (NA, VR, and NA + VR) had corresponding correlations of $(r = .567)$, $(r = .108)$, and $(r = .389)$. The NA, NA + VR, and the eighth grade marks were significant at the .01 level. The correlation of VR with algebra marks was not high enough to show a significant relationship at the .01 level. The best method of determining success in algebra, measured by yearly marks, was the marks received in eighth grade mathematics.